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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/449,215	11/24/1999	YASEEN SAMARA	15-IS-5290	6012

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EXAMINER	
KIM, CHONG R	
ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/449,215	SAMARA ET AL.	
	Examiner	Art Unit	
	Charles Kim	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6,7,11-14,17-23 and 26-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6,7,11-14,17-23 and 26-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 November 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment and Arguments

1. Applicant's amendment filed on August 9, 2004 has been entered and made of record.

2. Applicant's Declaration under 37 C.F.R. 1.131 filed on February 13, 2004 has been considered but is moot in view of the new ground(s) of rejection.

3. Applicant's arguments with respect to claims 1, 6, 14, 17, 18, 23, 27, 29 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 6-7, 11-12, 14, 17-21, 23, 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the textbook entitled "PACS: Basic Principles and Applications" by Huang ("Huang").

Referring to claim 1, Huang discloses an image management system comprising:

a. a picture archival and communications system (PACS) server (controller) having a plurality of inputs and outputs, the inputs configured to receive information signals and the outputs configured to provide image output signals (page 271, figure 10.2), the PACS server

configured to store information representative of a plurality of two dimensional image slices in DICOM3 format, and the output signals representative of the stored two dimensional image slices (pages 270-271, pages 274-275, and page 186);

b. an imaging device having an output coupled to at least one of the inputs of the PACS server, and configured to provide an image signal (page 225, figure 8.14 and page 270, figure 10.1);

c. a PACS workstation having an input coupled to at least one of the outputs of the PACS server, and configured to receive output signals from the PACS server representative of selected two dimensional image slices (page 285, figure 10.8), the PACS workstation configured to construct three dimensional image renderings from the two dimensional image slices (page 314, section 12.1.4.3 and figure 12.6), and the PACS workstation having an output coupled to the PACS server (page 285, figure 10.8).

Huang does not explicitly specify that the three dimensional image reconstruction renderings are generated from at least one of multi-plane reconstruction (MPR), multi-plane volume reconstruction (MPVR), and maximum intensity pixel (MIP) projection. However, Official notice is taken that at least one of multi-plane reconstruction (MPR), multi-plane volume reconstruction (MPVR), and maximum intensity pixel (MIP) projection were exceedingly well known types of three dimensional image reconstruction algorithms. Therefore, it would have been obvious to modify the three dimensional image reconstruction algorithm of Huang so that it comprises at least one of multi-plane reconstruction (MPR), multi-plane volume reconstruction (MPVR), and maximum intensity pixel (MIP) projection. The suggestion/motivation for doing so would have been to generate accurate three dimensional renderings, thereby enhancing the

diagnosis process.

Huang also does not explicitly disclose that the PACS workstation is configured to provide the PACS server with a signal representative of the three dimensional rendering. However, the Examiner notes that this feature would have been obvious in Huang for at least the following reasons. Huang explains that one of the main roles of the PACS server is to store and archive medical image data (pages 270-271). Huang also explains that the PACS workstation stores the rendered images until the patient is discharged or transferred (page 270). In other words, if the patient is discharged or transferred, then the three dimensional renderings would be lost, and as a result, the entire three dimensional reconstruction process would have to be repeated. Therefore, it would have been obvious to configure the PACS workstation so that it provides the PACS server with a signal representative of the three dimensional rendering. The suggestion/motivation for doing so would have been to store and archive (the main functions of the PACS server) the three dimensional renderings for future retrieval and diagnosis purposes. Accordingly, the efficiency of the diagnosis process would be greatly enhanced. Note that the PACS server has a much higher capacity of storage than the PACS workstation (pages 272-273), and therefore can continue to store the rendered images even if the patient is discharged or transferred. Also, the PACS workstation is capable of being configured to provide the PACS server with the three dimensional renderings, since both devices are connected through a bi-directional communication network (Ethernet) [page 285, figure 10.8].

Referring to claim 2, see the rejection of at least claim 1 above. As noted above, it would have been obvious to store the three-dimensional rendering signal in the PACS server. Note that

the image data stored in the PACS server would be in a file format, and therefore would comprise a three-dimensional rending file.

Referring to claim 3, see the rejection of at least claim 2 above. Huang further explains that the image files stored in the PACS server are selectively communicated to a PACS workstation (page 277, section 10.2.9).

Referring to claim 6, Huang further discloses that the imaging device is a medical imaging device (page 269, section 10.1.1).

Referring to claim 7, see the rejection of at least claim 2 above. As noted above, it would have been obvious to store the three-dimensional rendering signal in the PACS server. Accordingly, it would have been obvious to include a three-dimensional rending file storage in the PACS server, for the reasons stated above.

Referring to claims 11 and 12, see the rejection of at least claim 1 above.

Referring to claim 14, see the rejection of at least claim 1 above. Huang discloses a method of producing a rendering of a three dimensional object from a plurality of two dimensional image information files, comprising:

a. receiving by a PACS server, a plurality of two dimensional image information files from an imaging device (page 225, figure 8.14, page 270, figure 10.1, page 274);

b. storing the plurality of two dimensional image information files on the PACS server in DICOM3 format (pages 270-271, pages 274-275, and page 186);

c. communicating selected two dimensional image information files to the PACS workstation (page 275, section 10.2.3);

d. receiving a two dimensional image information file by the PACS workstation (page 277, section 10.2.9);

e. constructing a three dimensional image information file based on the selected two dimensional information files (page 314, section 12.1.4.3 and figure 12.6).

Huang does not explicitly specify that the three dimensional image reconstruction renderings are generated from at least one of multi-plane reconstruction (MPR), multi-plane volume reconstruction (MPVR), and maximum intensity pixel (MIP) projection. However, Official notice is taken that at least one of multi-plane reconstruction (MPR), multi-plane volume reconstruction (MPVR), and maximum intensity pixel (MIP) projection were exceedingly well known types of three dimensional image reconstruction algorithms. Therefore, it would have been obvious to modify the three dimensional image reconstruction algorithm of Huang so that it comprises at least one of multi-plane reconstruction (MPR), multi-plane volume reconstruction (MPVR), and maximum intensity pixel (MIP) projection. The suggestion/motivation for doing so would have been to generate accurate three dimensional renderings, thereby enhancing the diagnosis process.

Huang also does not explicitly disclose the step of communicating the three dimensional image information file to the PACS server. However, the Examiner notes that this feature would have been obvious in Huang for at least the following reasons. Huang explains that one of the main roles of the PACS server is to store and archive medical image data (pages 270-271). Huang also explains that the PACS workstation stores the rendered images until the patient is discharged or transferred (page 270). In other words, if the patient is discharged or transferred, then the three dimensional renderings would be lost, and as a result, the entire three dimensional

reconstruction process would have to be repeated. Therefore, it would have been obvious to communicate the three dimensional image information file to the PACS server. The suggestion/motivation for doing so would have been to store and archive (the main functions of the PACS server) the three dimensional renderings for future retrieval and diagnosis purposes. Accordingly, the efficiency of the diagnosis process would be greatly enhanced. Note that the PACS server has a much higher capacity of storage than the PACS workstation (pages 272-273), and therefore can continue to store the rendered images even if the patient is discharged or transferred. Also, the PACS workstation is capable of being configured to provide the PACS server with the three dimensional renderings, since both devices are connected through a bi-directional communication network (Ethernet) [page 285, figure 10.8].

Referring to claim 17, see the rejection of at least claim 14 above.

Referring to claim 18, see the rejection of at least claim 6 above.

Referring to claim 19, Huang further discloses that the communicating step is carried out over an Ethernet connection (page 275, section 10.2.3).

Referring to claim 20, see the rejection of at least claim 2 above.

Referring to claim 21, see the rejection of at least claim 3 above.

Referring to claim 23, Huang discloses a medical imaging system, comprising:

a. a medical scanner (page 269, section 10.1.1);

b. a PACS server coupled to the medical scanner and configured to receive and store signals representative of two dimensional image slices from the medical scanner (page 225, figure 8.14, page 270, figure 10.1, page 274);

c. a PACS workstation configured to receive selected signals representative of two dimensional image slices (page 277, section 10.2.9), and configured to construct a three dimensional rendering file from the signals representative of the two dimensional image slices (page 314, section 12.1.4.3 and figure 12.6).

Huang does not explicitly disclose that the three dimensional rendering file is communicated to and stored by the PACS server. However, the Examiner notes that this feature would have been obvious in Huang for at least the following reasons. Huang explains that one of the main roles of the PACS server is to store and archive medical image data (pages 270-271). Huang also explains that the PACS workstation stores the rendered images until the patient is discharged or transferred (page 270). In other words, if the patient is discharged or transferred, then the three dimensional renderings would be lost, and as a result, the entire three dimensional reconstruction process would have to be repeated. Therefore, it would have been obvious to communicate the three dimensional image information file to the PACS server for storage. The suggestion/motivation for doing so would have been to archive (the main functions of the PACS server) the three dimensional renderings for future retrieval and diagnosis purposes. Accordingly, the efficiency of the diagnosis process would be greatly enhanced. Note that the PACS server has a much higher capacity of storage than the PACS workstation (pages 272-273), and therefore can continue to store the rendered images even if the patient is discharged or transferred. Also, the PACS workstation is capable of being configured to provide the PACS server with the three dimensional renderings, since both devices are connected through a bi-directional communication network (Ethernet) [page 285, figure 10.8].

Referring to claim 26, Huang further discloses that the medical scanner is an ultrasound imaging device (page 224, section 8.7.4).

Referring to claim 27, Huang further discloses that the medical scanner is a magnetic resonance image device (MRI) [page 271, section 10.1.2.1].

Referring to claim 28, Huang further discloses that the medical scanner is a computed tomography (CT) imaging device (page 271, section 10.1.2.1).

Referring to claim 29, Huang further discloses that the PACS workstation includes a display (page 317, figure 12.6).

Referring to claim 30, Huang further discloses that the PACS workstation is configured to provide a three dimensional rendering representative of the three dimensional rendering file on the display (page 317, figure 12.6).

Referring to claim 31, see the rejection of at least claim 2 above.

5. Claims 13, 21, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the textbook entitled "PACS: Basic Principles and Applications" by Huang ("Huang") and Schuetz, U.S. Patent No. 6,206,566 ("Schuetz").

Referring to claim 13, Huang does not explicitly disclose that the three dimensional rendering file includes the parameters needed to reconstruct the three dimensional image rendering. However, this feature was exceedingly well known in the art. For example, Schuetz discloses parameters that are needed to reconstruct three dimensional image renderings (col. 2, line 60-col. 3, line 3).

Huang and Schuetz are combinable because they are both concerned with three dimensional medical imaging systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the three dimensional rendering file of Huang so that it includes the parameters of Schuetz. The suggestion/motivation for doing so would have been to provide a proper reconstruction of the three dimensional rendering during the diagnosis process (Schuetz, col. 1, lines 26-31). Therefore, it would have been obvious to combine Huang with Schuetz to obtain the invention as specified in claim 13.

Referring to claim 21, see the rejection of at least claim 13 above.

Referring to claim 32, see the rejection of at least claim 13 above.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ck
January 8, 2005

Jon Chang
Primary Examiner